

NEW VASCULAR PLANT RECORDS AND THE
INCREASE OF EXOTIC PLANTS IN
GLACIER NATIONAL PARK, MONTANA

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ABSTRACT

We report 39 additions to the flora of Glacier National Park. Fourteen of these are exotic weeds. Both the number of exotics and visitors have increased at an accelerating rate since 1920. These findings suggest that control of exotics will be an increasingly difficult task for managers of popular reserves.

Congress established Glacier National Park (GNP) in 1910. In 1919 Paul Standley conducted the first systematic botanical survey and published the results in *Flora of Glacier National Park, Montana* (Standley 1921). Since then botanical studies and collecting have been sporadic (see references in Lesica 1985). During the 1950's and 1960's LeRoy Harvey and his students at the University of Montana collected extensively in Glacier National Park and discovered many new additions (Harvey 1954; Bamberg and Pemble 1968). Published reports and specimens housed in the Glacier National Park herbarium served as the sources for a recent checklist of the park's flora (Lesica 1985). Since then, we and a number of park employees have collected many new records. In addition, some records have been found in herbaria at the University of Montana (MONTU) and Montana State University (MONT). Here we report 39 additions to the flora of Glacier National Park. Reports of *Barbarea vulgaris*, *Cardamine oligosperma* var. *kamtschatica*, *Carex tenuiflora*, *Draba macounii*, *Petasites frigidus*, *Sagina nivalis*, and *Satureja vulgaris* have been published previously (Lesica et al. 1986; Lackschewitz et al. 1988; Lesica 1991). Nomenclature follows Hitchcock and Cronquist (1973). Specimens housed at the Glacier National Park herbarium in West Glacier are followed by (GNP).

Fourteen (36%) of the species reported here are introduced Eurasian weeds (preceded by an asterisk). By 1920 at least 57 species of exotics were already present (Standley 1921). Since then, this number has increased steadily. At the same time, the number of

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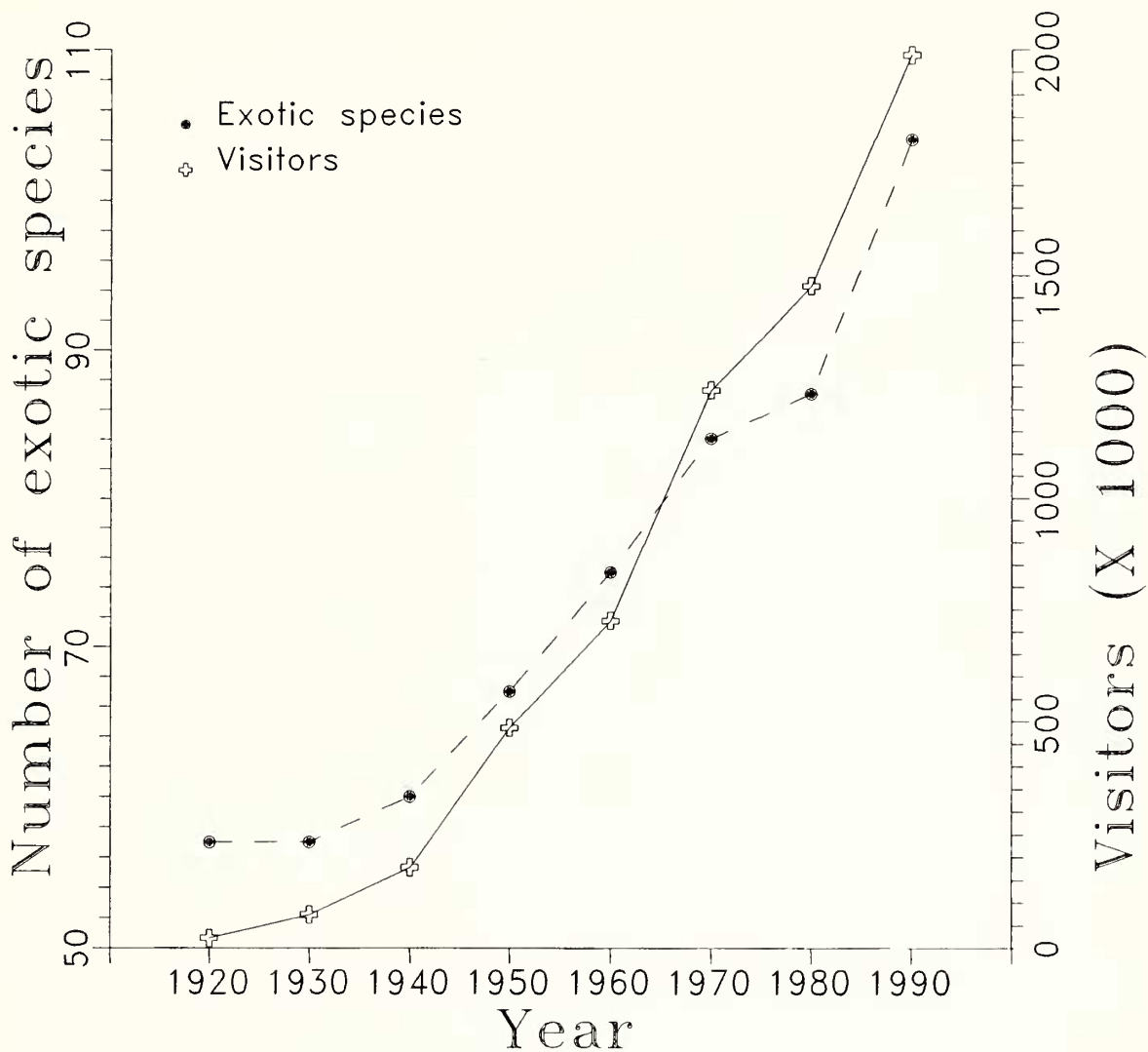


FIG. 1. Number of exotic plant species occurring in Glacier National Park based on herbarium records and published literature and number of visitors to GNP based on official records since 1920.

visitors to the park has also increased. Most of this visitation is by automobile, one of the most common vectors for the transport of exotic weeds (Baker 1972; Sauer 1988; Tyser and Worley 1992). The strong correlation between increasing visitation and the increasing number of exotics (Fig. 1) suggests that invasion by weeds will continue to be a problem to managers of high-profile reserves. Monitoring the success of new invaders will be an increasingly important part of resource management in these reserves.

Agropyron scribneri Vasey (Poaceae).—Glacier Co., windswept ridge NW of Poia Lake, common in limestone shingle with *Eriogonum androsaceum* and *Potentilla fruticosa*, 2469 m, 6 Jul 1985, P. Lesica 3502 (GNP).

Antennaria pulcherrima (Hook.) Greene (Asteraceae).—Glacier Co., S edge of Lunch Creek cirque ca. 1.2 km NE of Logan Pass, locally common in moist tundra with *Carex scirpoidea* and *C. capillaris*, 2164 m, 10 August 1989, P. Lesica and B. McCune 4963 (ALTA, MONTU); same location, 8 Aug 1990, P. Lesica 5225 (GNP, MONTU) (collections verified by R. Bayer, ALTA).

**Arenaria serpyllifolia* L. (Caryophyllaceae).—Flathead Co., West Glacier, Park headquarters, common in compacted soil just N of garage area with *Potentilla argentea* and *Poa annua*, 945 m, 3 Jun 1986, *P. Lesica* 3762 (GNP, MONTU).

**Artemisia absinthium* L. (Asteraceae).—Flathead Co., along Hwy 2 near Middle Fork Flathead River ca. 4.8 km S of Walton Ranger Station, uncommon in gravelly soil with *Dactylis glomerata* and *Iliamna rivularis*, T29N R15W S30, 1250 m, 10 Jul 1991, *P. Lesica* 5483 (GNP, MONTU); West Glacier, along footpath between maintenance yard at park headquarters and Middle Fork Flathead River with *Agrostis alba* and *Melilotus officinalis*, 975 m, 23 Aug 1991, *P. Lesica* 5597 (GNP, MONTU).

**Bromus commutatus* Schrad. (Poaceae).—Flathead Co., Lake McDonald, disturbed area along creek, in gravel, 975 m, 2 Jul 1942, *W. Booth s.n.* (GNP, MONT); S-facing slopes of Apgar Mountain just N of the Middle Fork Flathead River, locally common in shallow, rocky soil with *Agropyron spicatum* and *Epilobium paniculatum*, T31N R19W S5 NE¼, 1097 m, 9 Jul 1990, *P. Lesica* 5152 (GNP).

**Campanula glomerata* L. (Campanulaceae).—Flathead Co., SW end of Ruhle Drive in the residence area at West Glacier, in a meadow with *Bromus inermis* and *Chrysanthemum leucanthemum*, 945 m, 2 Jul 1986, *P. Lesica* and *A. DeBolt* 3924 (GNP).

Carex concinna R. Br. (Cyperaceae).—Flathead Co., along N shore of Kintla Lake, shaded site, 25 May 1979, *J. Beehler* 58 (MONTU); North Fork Flathead River, locally common in mossy soil beneath spruce trees on a gravelly shore with *Viola adunca* and *Fragaria virginiana*, T36N R21W S31 NE¼, 1122 m, 10 Jun 1988, *P. Lesica* 4562 (GNP, MONTU); along the inside road ca. 0.3 km S of Ford Creek, locally common in wet, marshy soil, in a seep area with *Carex capillaris* and *Linnaea borealis*, T36N R21W S19, 1134 m, 10 Jun 1988, *P. Lesica* 4564 (GNP, MONTU).

**Centaurea jacea* L. (Asteraceae).—Flathead Co., Bowman Lake area, S of picnic area, approx. 0.65 ha of knapweed, T35N R20W S5, 1228 m, 2 Sep 1989, *G. Vodehnal s.n.* (GNP).

**Crepis tectorum* L. (Asteraceae).—Flathead Co., disturbed area in a lawn at Pole-bridge Ranger Station along North Fork Flathead River, 1100 m, 20 Aug 1983, *J. DeSanto s.n.* (GNP).

**Dianthus armeria* L. (Caryophyllaceae).—Glacier Co., Lubec area, roadside near railroad near Firebrand Pass trailhead, 22 Aug 1989, *J. DeSanto s.n.* (GNP).

Dicentra uniflora Kell. (Fumariaceae).—Flathead Co., Blacktail Hills area, dry S-facing slopes, 1630 m, 16 Apr 1992, *J. DeSanto s.n.* (GNP).

Draba verna L. (Brassicaceae).—Flathead Co., along the Middle Fork of Flathead River near the old bridge ca. 0.2 km upstream of the residence area, uncommon in moist open soil of rock outcrops growing in moss, 945 m, 5 May 1985, *P. Lesica* and *A. DeBolt* 3307 (GNP); same location, 3 May 1991, *P. Lesica* 5293 (GNP, MONTU).

Eleocharis pauciflora (Lightf.) Link (Cyperaceae).—Flathead Co., ca. 0.3 km NW of Mt. Reynolds, ca. 1.2 km S of Logan Pass, locally common in muddy, thin soil of seepy areas on rock shelves with *Juncus triglumis* and *Carex nigricans*, 2255 m, 2 Aug 1987, *P. Lesica* and *K. Ahlenslager* 4457 (GNP, MONTU); —Glacier Co., Mt. Reynolds, Logan Pass, wet tundra terrace, 9 Aug 1960, *W. B. Schofield s.n.* (MONTU); cirque on E side of Mt. Reynolds, ca. 1.2 km S of Logan Pass, common in wet mud of a seep area on a bench with *Juncus mertensianus* and *Tofieldia glutinosa*, 2255 m, 9 Aug 1988, *P. Lesica* and *K. Ahlenslager* 4715 (GNP, MONTU).

Epilobium palustre L. (Onagraceae).—Flathead Co., “Moose Meadow”, open *Carex* marsh, T33W R19W S18, 7 Jul 1969, *M. Mooar* 10911 (MONTU); *Typha* marsh, small pool in forest of mixed conifers and birch, T34N R20W S35, 8 Jul 1969, *M.*

Mooar 10982 (MONTU); S end of McGee's meadow, common in wet organic soil with *Carex lasiocarpa* and *C. buxbaumii*, 1219 m, 4 Jul 1985, *P. Lesica 3481* (GNP).

Erigeron ochroleucus Nutt. (Asteraceae).—Glacier Co., Chief Mountain, dry slopes, 1951 m, 26 Jun 1989, *J. DeSanto s.n.*; Chief Mountain, open dry slopes, 2057 m, 26 Jun 1990, *J. DeSanto s.n.* (GNP).

**Erodium cicutarium* (L.) L'Her. (Geraniaceae).—Glacier Co., a few plants along the road ca. 5 km W of east entrance, 1385 m, 23 Jun 1963, *W. E. Booth 63122* (MONT); Flathead Co., disturbed area at Polebridge Ranger Station, 1100 m, 26 May 1983, *Jerry DeSanto s.n.* (GNP); disturbed ground in maintenance area by Park headquarters. West Glacier, 975 m, 10 Jun 1986, *A. DeBolt s.n.* (GNP).

Juncus tenuis Willd. (Juncaceae).—Flathead Co., "Moose Meadow", open *Carex* marsh, T33N R19W S18, 7 Jul 1969, *M. Mooar 10910* (MONTU); wet meadows, 1951 m, 29 Aug 1977, *P. Zager s.n.* (MONTU); along McDonald Creek ca. 0.2 km below the outlet of McDonald Lake, common in moist gravelly soil with *Rorippa islandica* and *Agrostis alba*, 960 m, 8 Sep 1985, *P. Lesica 3680* (GNP, MONTU); — Glacier Co., along trail to Firebrand Pass ca. 1.5 km NW of Lubec Lake, common in lodgepole pine forest with *Agrostis exarata* and *Deschampsia elongata*, 1676 m, 9 Aug 1991, *P. Lesica 5577* (GNP, MONTU).

Lewisia rediviva Pursh (Portulacaceae).—Blacktail Hills (also across Highway 2 in Flathead National Forest), dry open slopes, 1554 m, 29 Jun 1989, *J. DeSanto s.n.* (GNP).

Linanthus septentrionalis Mason (Polemoniaceae).—Flathead Co., Blacktail Hills, dry S-facing slope, 1615 m, 24 Jun 1990, *J. DeSanto s.n.* (GNP); —Glacier Co., steep S-facing slope NW of Poia Lake with *Saxifraga bronchialis* and *Potentilla glandulosa*, common in rocky soil, 2134 m, 6 Jul 1985, *P. Lesica 3503* (GNP, MONTU).

**Lolium multiflorum* Lam. (Poaceae).—Flathead Co., old roadway along the N side of Middle Fork Flathead River just below residence area, T32N R19W S36, 975 m, 9 Jul 1990, *P. Lesica 5155* (GNP, MONTU).

**Lomatium cous* (Wats.) Coult. & Rose (Apiaceae).—Flathead Co., bare slopes and ridges, 1700 m, 4 May 1992, *J. DeSanto & R. Mattson s.n.* (GNP).

**Medicago lupulina* L. (Fabaceae).—Glacier Co., scattered plants in disturbed area at the east entrance, 1385 m, 14 Jun 1952, *W. E. Booth s.n.* (MONT).

**Myosotis scorpioides* L. (Boraginaceae).—Flathead Co., along the Middle Fork Flathead River just upstream of West Glacier bridge, common in open cedar-spruce forest with *Aralia nudicaulis* and *Disporum trachycarpum*, 945 m, 1 Jun 1985, *P. Lesica 3343* (MONTU).

Ophioglossum vulgatum L. (Ophioglossaceae).—Flathead Co., S side of and between Howe Lakes, local and uncommon in a moist meadow with *Botrychium multifidum* and *Lycopus uniflorus*, 1250 m, 2 Sep 1988, *P. Lesica 4745* (GNP, MONTU).

Orobanche fasciculata Nutt. (Orobanchaceae).—Flathead Co., Blacktail Hills, open dry hillside, 1676 m, 5 Jul 1990, *J. DeSanto s.n.* (GNP); —Glacier Co., Napi Point, dry open slopes, 1981 m, 29 Jul 1989, *J. DeSanto s.n.* (GNP).

Polygonum kelloggii Greene (Polygonaceae).—Glacier Co., lower end of Preston Park near treeline ca. 1.8 km NE of Logan Pass, abundant in open soil of a late snowmelt-temporary pond area with *Senecio cymbalarioides* and *Juncus mertensianus*, 2164 m, 10 Sep 1987, *P. Lesica 4513* (GNP, JEPS, MONTU) (collection verified by J. Hickman, JEPS).

Potentilla ovina Macoun (Rosaceae).—Glacier Co., near east entrance, roadside, rocky outcrop, 15 August 1942, *W. E. Booth s.n.* (MONT); Piegan Mtn., Logan Pass, rocky

talus, 1970 m, 27 Jul 1954, *L. Harvey 6089a* (MONTU); Divide Mtn., NW slope of peak near treeline associated with scattered krumholz, 2150 m, 26 Jun 1964, *L. Harvey and R. Pemble 7046* (MONTU); windswept ridge NW of Poia Lake, common in limestone shingle with *Eriogonum androsaceum* and *Potentilla fruticosa*, 2469 m, 6 Jul 1985, *P. Lesica 3497* (GNP, MONTU); *Harvey 6089a* and *Harvey and Pemble 7046* verified by B. Johnston (COLO).

**Potentilla recta* L. (Rosaceae).—Flathead Co., West Glacier at intersection of Going-to-the-Sun Road and drive to residence area, small population in gravelly soil along road with *Centaurea maculosa* and *Linaria vulgaris*, T32N R19W S26, 975 m, 8 Aug 1991, *P. Lesica 5574* (GNP, MONTU).

Ranunculus abortivus L. (Ranunculaceae).—Flathead Co., confluence of McDonald Creek and Middle Fork of Flathead River, T32N R19W S27, 14 Jun 1968, *M. Mooar 8090* (MONTU); Logging Creek Ranger Station, common in parking area, 1048 m, 7 Jun 1985, *A. DeBolt 525* (GNP).

**Ranunculus acris* L. (Ranunculaceae).—Glacier Co., 2.7 km N of Belly River Ranger Station on old wagon road, in grass meadows, 10 Jul 1986, *D. Shea s.n.* (GNP); along small drainages flowing into Swiftcurrent Creek just below the lake near the horse trail, common with *Poa compressa* and *Trifolium repens*, 1460 m, 19 Jul 1987, *P. Lesica and K. Ahlenslager 4410* (GNP, MONTU); at entrance to Many Glacier campground near telephone booth just W of the residence area, small colony with *Poa pratensis*, 1494 m, 8 Jul 1990, *P. Lesica and K. Ahlenslager 5143* (GNP, MONTU).

Ranunculus cardiophyllus Hook. (Ranunculaceae).—Glacier Co., W edge of Belly River Ranger Station pasture, native bunchgrass meadow, 7 Jun 1988, *D. Shea s.n.* (GNP).

Ranunculus pygmaeus Wahlenb. (Ranunculaceae).—Glacier Co., N-facing cliff on Mt. Kipp, common in moist gravelly soil with *Salix arctica* and *Carex bipartita*, 2377 m, 3 Aug 1985, *P. Lesica & A. DeBolt 3602* (GNP, MONTU); W side of Mt. Reynolds ca. 0.6 km S of Logan Pass, scattered in wet boggy soil in seepy areas on rock shelves with *Tofieldia pusilla* and *Saxifraga debilis*, 2316 m, 2 Aug 1987, *P. Lesica and K. Ahlenslager 4453* (GNP, MONTU).

Sanguisorba occidentalis Nutt. (Rosaceae).—Flathead Co., West Glacier, Park headquarters, locally common in compacted soil N of garage area with *Poa annua* and *Potentilla argentea*, 945 m, 13 Jun 1986, *P. Lesica and A. DeBolt 4131* (GNP, MONTU).

Sanicula graveolens Poepp. (Apiaceae).—Flathead Co., Blacktail Hills, rocky wet slopes, 1524 m, 16 Jun 1990, *J. DeSanto s.n.* (GNP); S-facing slopes of Apgar Mountain just N of the Middle Fork Flathead River, locally common in shallow, rocky soil with *Agropyron spicatum* and *Epilobium paniculatum*, T31N R19W S5 NE¼, 1219 m, 9 Jul 1990, *P. Lesica 5153* (GNP, MONTU).

Saxifraga oregana Howell var. *subapetala* (A. Nels.) Hitchc. (Saxifragaceae).—Flathead Co., Blacktail Hills, damp open slopes among Douglas-fir with *Erythronium grandiflorum* and *Polygonum bistortoides*, 1753 m, 16 Jun 1990, *J. DeSanto s.n.* (GNP).

Senecio pauperculus Michx. (Asteraceae).—Flathead Co., trail to Kootenai Lake, old sphagnum bog with small stream through it, T37N R18W, 29 Jul 1966, *M. Mooar 2977* (MONTU); wet area near Polebridge, small stream and marshy area, T35N R21W S21, 1 Jul 1969, *M. Mooar 10700* (MONTU); bench just N of Trail Creek, ca. 0.9 km W of North Fork Road with *Pinus contorta*, T37N R22W S34, 1219 m, 22 Jul 1977, *P. Zager s.n.* (MONTU); 0.6 km S of Goat Haunt Ranger Station, wet marsh, 27 Jul 1990, *J. DeSanto s.n.* (GNP).

Senecio streptanthifolius Greene (Asteraceae).—Glacier Co., on top of Milk River Ridge above Cutbank Ranger Station near boundary of Glacier National Park, 3 Jul 1953, *J. McMullen 1055* (MONTU); Cutbank Ranger Station meadow, 3 Jul 1955, *R. Person s.n.* (MONTU); steep N-facing slope just S of Poia Lake, common in limestone talus with *Potentilla fruticosa* and *P. nivea*, 2012 m, 5 Jul 1985, *P. Lesica 3487* (GNP, MONTU).

**Veronica arvensis* L. (Scrophulariaceae).—Flathead Co., West Glacier, Park headquarters, common in compacted soil just N of garage area with *Potentilla argentea* and *Poa annua*, 945 m, 3 Jun 1986, *P. Lesica 3760* (GNP, MONTU).

Viola purpurea Kell. var. *venosa* (Wats.) Brain. (Violaceae).—Flathead Co., Blacktail Hills, dry S-facing slope with *Erythronium* and *Claytonia*, 1676 m, 5 Jun 1990, *J. DeSanto s.n.* (GNP).

LITERATURE CITED

- BAKER, H. G. 1972. Migration of weeds. Pp. 327–347 in D. H. Valentine (ed.), *Taxonomy, phytogeography and evolution*. Academic Press, London.
- BAMBERG, S. A. and R. H. PEMBLE. 1968. New records of disjunct arctic-alpine plants in Montana. *Rhodora* 70:103–112.
- HARVEY, L. H. 1954. Additions to the flora of Glacier National Park, Montana. *Proceedings of the Montana Academy of Sciences* 14:23–25.
- HITCHCOCK, C. L. and A. CRONQUIST. 1973. *Flora of the Pacific Northwest*. University of Washington Press, Seattle, WA. 730 p.
- LACKSCHEWITZ, K., P. LESICA, and J. S. SHELLY. 1988. Noteworthy collections: Montana. *Madroño* 35:355–358.
- LESICA, P. 1985. Annotated checklist of vascular plants of Glacier National Park, Montana. Monograph No. 4, Montana Academy of Sciences, Supplement to the *Proceedings*, Vol. 44.
- LESICA, P. 1991. Noteworthy collections: Montana. *Madroño* 38:297–298.
- LESICA, P., K. LACKSCHEWITZ, J. PIERCE, S. GREGORY, and M. O'BRIEN. 1986. Noteworthy collections: Montana. *Madroño* 33:310–312.
- SAUER, J. D. 1988. *Plant migration*. University of California Press, Berkeley, CA. 282 p.
- STANDLEY, P. C. 1921. Flora of Glacier National Park, Montana. *Contributions to the U.S. National Herbarium* 22:235–438.
- TYSER, R. W. and C. A. WORLEY. 1992. Alien flora in grasslands adjacent to road and trail corridors in Glacier National Park, Montana (U.S.A.). *Conservation Biology* 6:253–262.

(Received 10 Jul 1992; revision accepted 30 Sept 1992.)